Claims:

I claim:

1. A process for generating fuzzy cognitive maps, comprising:

(a) selecting an equation or set equations that models the behavior of some phenomenon;

(b) selecting a range for each input variable in said equation or set of equations;

(c) selecting the number of trials;

(d) selecting the logical distribution function of each of the said input variables;

(e) selecting at least two fuzzy level boundaries for each of the said phenomenon;

(f) generating values for all of said input variables of all of said trials, within said input variable's said range and within said logical distribution, using Monte Carlo simulations;

(g) solving said equation or equations to produce outputs to produce a Meta Model;

(h) increasing or decreasing the generated values of one of said input variables by fixed increments for each of said trials;

(i) solving said equation or equations using the incremented or decremented values of one of said input values;

(j) identifying the fuzzy level placement within said fuzzy level boundary for each of said outputs generated using said incremented or decremented input values for each of said trials;

(k) calculating the probability of said fuzzy level placement for one of said outputs by dividing the number of said outputs at each of the said fuzzy levels by the number of said trials;

(l) categorizing said fuzzy level placements for said output as indicating a positive or negative correlation.

(m) categorizing the magnitude of said fuzzy level placement when there are more than two of the said fuzzy level boundaries;

(n) repeating the process steps h through m for each of the remaining input variables; and

(o) mapping said correlations and said probabilities of the relationships between said input variables and phenomena in the form of a fuzzy cognitive map.

2. A process as described in claim 1, wherein said range for each input variable in said equation or set of equations are derived from an improved Meta Model with output values the same or close to selected target values.

3. A process as described in claim 2, wherein said ranges for each of said input variables derived from said improved Meta Model are used as design parameters for controlling the behavior of said phenomena.

4. A computer system for generating a fuzzy cognitive map, comprising:

(a) means for selecting an equation or set of equations that models the behavior of some phenomena;

(b) means for selecting a range for each input variable in said equation or set of equations;

(c) means for selecting the number of trials;

(d) means for selecting the logical distribution function of each of the said input variables;

(e) means for selecting at least two fuzzy level boundaries for each of said phenomenon;

(f) means for generating values for all of said input variables of all of said trials, within said input variable's said range and within said logical distribution, using Monte Carlo simulations;

(g) means for solving said equation or equations to produce outputs to produce a Meta Model;

(h) means for increasing or decreasing the generated values of one of said input variables by fixed increments for each of said trials;

(i) means for solving said equation or equations using the incremented or decremented values of one of said input values;

(j) means for identifying the fuzzy level placement within said fuzzy level boundary for each of said outputs generated using said incremented or decremented input values for each of said trials;

(k) means for calculating the probability of said fuzzy level placement for one of said outputs by dividing the number of said outputs at each of the said fuzzy levels by the number of said trials;

(l) means for categorizing said fuzzy level placements for said output as indicating a positive or negative correlation.

(m) means for categorizing the magnitude of said fuzzy level placement when there are more than two of the said fuzzy level boundaries;

(n) means for repeating the process steps h through m for each of the remaining input variables; and

(o) means for mapping said correlation and said probabilities of the relationships between said input variables and phenomena in the form of a fuzzy cognitive map.

5. A computer system as described in claim 4, wherein said range for each input variable in said equation or set of equations are derived from an improved Meta Model with output values the same or close to selected target values.

6. A computer system as described in claim 5, wherein said ranges for each of said input variables derived for said improved Meta Model are used as design parameters for controlling the behavior of said phenomena.